

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

# **PATENT SPECIFICATION**

**489,896**

Applicant Date: Aug 20 1937 No. 22859 / 37

Completed Specification Accepted 3 July 15, 1938

1. Sep. 1938

# **COMMITTEE SPECIFICATION**

## **Improvements in and relating to Bung Bushes.**

W. G. COOK, V. A. M. WILKINSON,  
German Ambassador  
partnered by  
Gesellschaft für  
Kolin-Ehrenfeld, Germany, do hereby  
declare the nature of their invention  
in what manner it is  
formed, to be particularly described and  
ascertained in and by the following  
statement:—

The invention relates particularly to bung bushes of the kind which, on being fixed to the wall of sheet-metal containers 15 and the like, are subjected to a subsequent deformation.

Hitherto such hung bushes have had to be made from a relatively expensive, high-quality material which will stand deformation when in the cold state, for instance from malleable steel.

Not only is the material very costly, but the cost of manufacture is considerably greater than is the case with bushes 25 which can be made of material that can be cast. The bung bushes which are to be deformed are in most cases stamped out of the solid material and are pressed to the correct form in further operations 30 either in the hot or cold state. The thread for the reception of the bung must then be specially cut and the tight-jointing surfaces for the bung packing and the additional packing have to be 35 specially turned. Besides the inconvenience of this mode of manufacture the waste of material in the case of bung bushes stamped out of the solid material is a serious matter. With bung bushes 40 of a known kind this waste amounts for instance to about 60%.

On the other hand hung bushes made for instance by die-casting or the like have a great advantage which is due to the lower manufacturing costs. The die-cast bushes are produced in the press die in the completely finished form including the thread and require no subsequent operations. As however die-casting cannot be employed for hung bushes which have to be subsequently deformed when being fixed, as it is unsuitable for being deformed in the cold state, such

old and new cases in  
the United States determined in  
the year 1851.

The invention overcomes the existing disadvantages by using a bung bush of the kind which are composed of two simple materials. According to the invention, that part of the bush which is to be deformed consists of a material capable of being deformed when in the cold state, whilst the remaining part of the bung bush consists of a non-deformable material, for instance a die-cast material, which to an admirable extent embraces the part which is to be deformed. This has the advantage that the bung bush can be made mainly of die-cast or otherwise cast material without there being any waste of material and without the necessity of subsequent tooling. As the deformable part a simple metal ring cast in the bush is mostly used, which is preferably provided with perforations, for the purpose of giving the molten material the possibility of adhering more firmly to the applied part and of increasing the stability of the bush.

Through the avoidance of all waste and through the simplified mode of manufacture of the bung bush the manufacturing costs are greatly reduced as compared with the stamped and pressed bung bushes. In view of the considerable mass production of bung bushes the saving described is particularly important.

Containers with hung closures are exported over-seas in very great quantities. As the hung bush according to the invention is considerably lighter than the bush stamped from the solid and deformed, the saving in weight will result in an appreciable reduction in freight charges. Finally, the hung bush made in accordance with the invention has a better appearance than the bushes hitherto in use.

A further feature of the invention consists in this, that through the employment of two different materials for hung bushes, it becomes possible to provide an

additional packing which is pressed by that part of the bush or metal ring, which is to be deformed, against the bush carrier. The importance of the increased security in the tight-jointing of the bung bush must not be underestimated.

In the drawing Fig. 1 represents in cross-section a bung bush inserted in the bush bearing of a container wall, the bush being shown on the left-hand side before being fixed to the container wall *k*; *l* and on the right-hand side after being fixed. The bung bush consists of the deformable ring *a* which is cast in the bush body *b* made for instance of die-cast material. The ring *a* may be made in a simple way for instance of band iron. It is inserted in the die-casting mould and the remaining space in the die is filled with die-casting material. The threaded part *c* is also formed in the die-casting mould, so that the bush is directly ready for use after being removed from the die. For obtaining better cohesion between the ring *a* and the die-cast body *b* the former may with advantage have a portion *d* of the inserted part expanded. The flange of the bush body *b* is made polygonal in a known manner for preventing the bung bush from turning. Fig. 2 illustrates a further constructional form of the arrangement according to the invention in cross-section. In this case the ring *a* is provided with perforations *e* which are filled by the die-cast material and ensure a further better cohesion of the two different materials. In the side view of the bung bush according to Fig. 3 the arrangement of the perforations *e* is more clearly seen.

Fig. 4 shows the cross-section and Fig. 5 the side view of another constructional form according to the invention of the bung bush, the ring *a* having trapezium-shaped pieces *f* cut out of it, which are filled by the die-cast material. In this way continuity of the die-cast material on either side of the ring *a* is obtained.

Fig. 4 is a cross-section on line A—A of the bush shown in Fig. 5.

A special constructional form of the bung bush is shown in Fig. 6 in cross-section. The ring *a* is at the same time the carrier of the thread *c* and thus forms the inner part of the bush, whilst the outer part *b* consists of die-cast material. The thread *c* can be formed on the ring *a* before the latter is inserted into the die-casting mould or it is subsequently cut.

The perforations *g* in this case again serve for producing a better cohesion between the ring *a* and the die-cast body *b*. When the thread *c* is produced before the bung bush is finished the press mould

may with advantage have a continuously threaded holding device fitting the thread, so that the thread will also be produced in its finished form at the perforations *g*, when the die-casting material is introduced. In the constructional form shown in Fig. 6 there is also shown, how an additional tight-jointing of the bung bush with respect to the container wall may be effected. The drawn out collar *l* of the container wall *k* is preferably extended somewhat further than the neck *h* of the die-cast body *b*. The packing *i* is placed in the groove thus formed. Fig. 7 shows in cross-section the finished bung bush fixed in position, with the pressed-in packing *i* between the collar *l* of the container opening and the neck *h* of the die-cast body *b* on the one hand and the beaded-over rim *n* of the ring *a* on the other hand. As the rim *n* is laid over, the packing *m* will at the same time be pressed tightly between the bung bush *b* and the container wall *k*. A characteristic feature of the bung bushes constructed as shown in Figs. 1 to 7 is, that a saving of material of at least 60% is obtained. For instance, the blank from which the bung bush as hitherto usually made is formed weighs 230 gr., whilst the finished bung weighs 85 gr., so that there is a waste of material of 145 gr. or 63 %. In contradistinction thereto in the case of a bung bush constructed in accordance with the invention all waste of material is avoided.

Fig. 8 shows a cross-section through a bung bush which is fixed in a different manner to the container wall. The bush body *a* is for instance made of die-cast material, the deformable metal ring *p* being cast in the bush body. The perforations *q* in the ring *p* again serve the purpose of obtaining a better cohesion between the die-cast parts and the metal rings. Between the metal ring *p* and the polygonal flange *r* the groove *s* is preferably left for the insertion of a packing *t*.

In Fig. 9 the bung bush is shown in cross-section fixed in position, the bung *u* being screwed in. By laying over the metal ring *p*, the collar *v* of the container wall *k* is pressed into the groove *s* against the packing *j*. The polygonal flange *r* at the same time lays itself into a suitable, previously drawn recess of the container wall *k*. A constructional form of the bung bush according to the invention, which differs still more than the form shown in Fig. 8, is shown in Fig. 10 in cross-section, before being fixed, and in Fig. 11, after being fixed to the container wall *k*. On the metal ring *p* being laid over, the packing *w* provided

in a groove  $x$  is compressed, a pressure-distributing washer  $z$  being optionally provided.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A bung bush for bung closures which is subjected, when being fixed to the container wall, to a deformation while in the cold state, and which is composed of two different materials, characterised by the feature that that part of the bush, which is to be deformed, consists of a material capable of being deformed when in the cold state, whilst the remaining part of the bung bush consists of a non-deformable material, for instance a die-cast material, which to an admissible extent embraces the part which is to be deformed.

2. A bung bush as claimed in Claim 1, characterised by the feature that the part of the bung bush, which is to be deformed, is formed by a metal ring which may be provided with perforations which are filled by the cast material, for instance die-cast material.

3. A bung bush as claimed in Claims 1 and 2, characterised by the feature that the part to be deformed, for instance the ring-shaped part of the bung bush, forms the outer closure of the neck of the bung bush.

4. A bung bush as claimed in Claims 1 and 2, characterised by the feature that the part of the bung bush which is to be deformed forms the inner part of the bung bush and is the carrier of the bung thread.

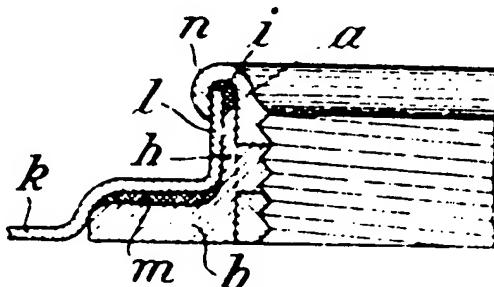
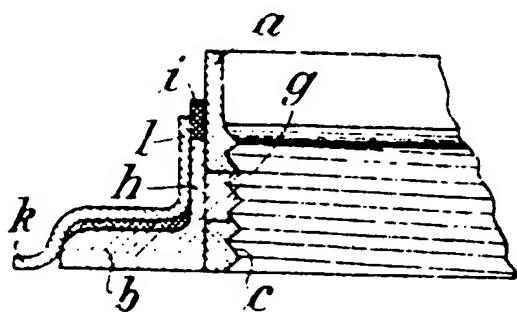
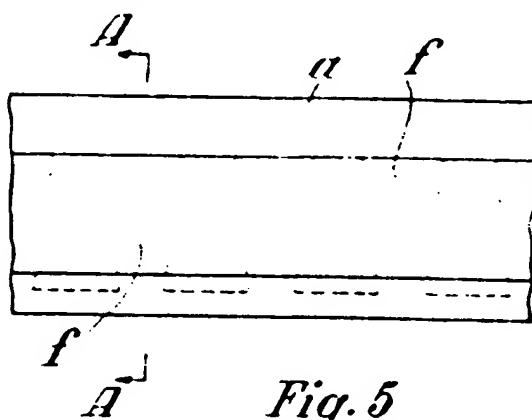
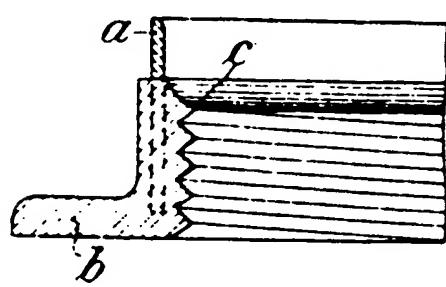
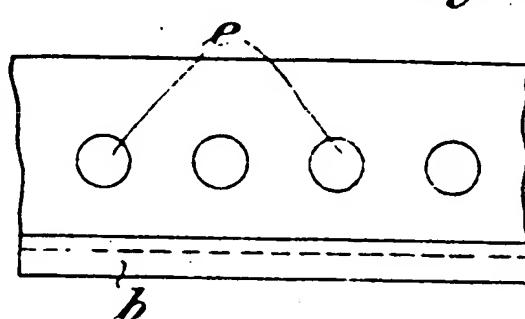
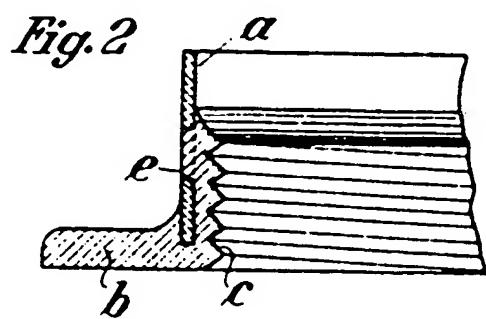
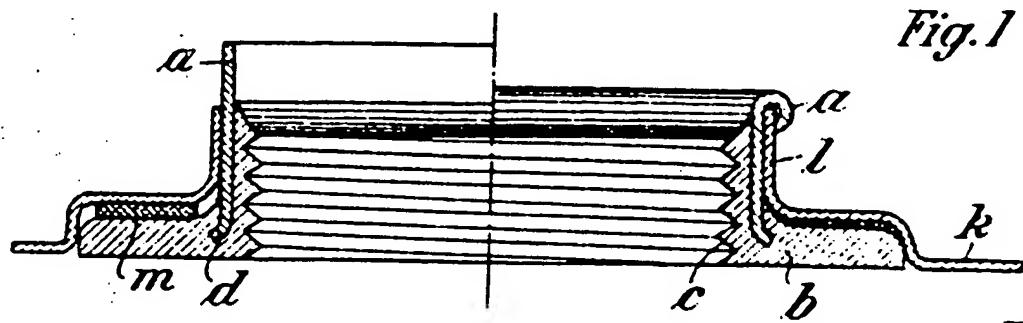
5. A bung bush as claimed in Claims 1 and 2, characterised by the feature that that portion of the deformable part, which is surrounded by the bung body of cast material, is expanded at an angle.

6. A bung bush as claimed in Claims 1 and 2, characterised by the provision of a packing which, on the deformable part of the bung bush being laid over, is pressed against a collar which is drawn outwards from the container wall and the neck of the bung bush which is for instance set back with respect to the said collar.

7. A bung bush as claimed in Claims 1, 2 and 5, characterised by the feature that the deformable part of the bung bush, on being laid over, presses a collar, which is formed by the container wall being drawn outwards, against a packing disposed in a groove in the bush, thereby providing a seal between the container wall and the bung bush.

8. The improved bung bush for bung closures, substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 20th day of August, 1937.  
MARKS & CLERK.



*[This drawing is a reproduction of the original on a reduced scale.]*

Fig. 8

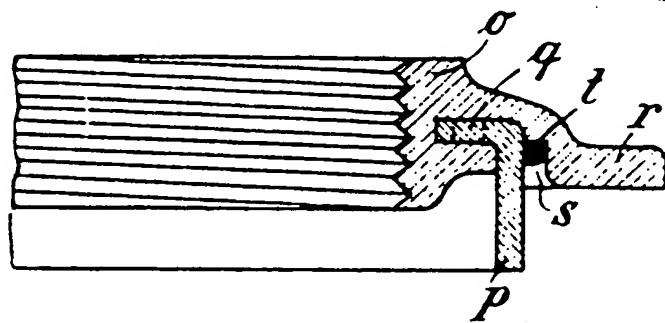


Fig. 9

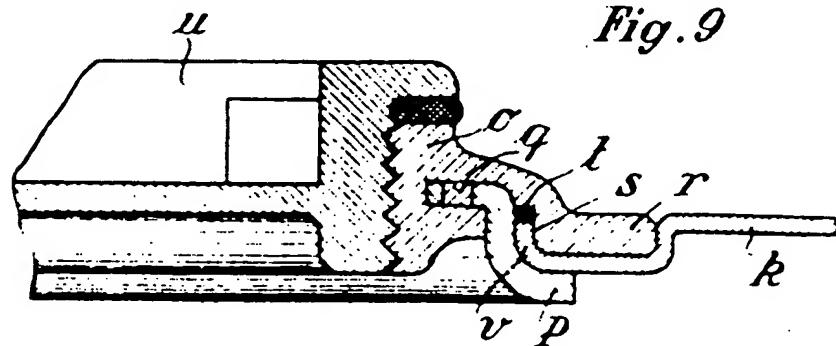


Fig. 10

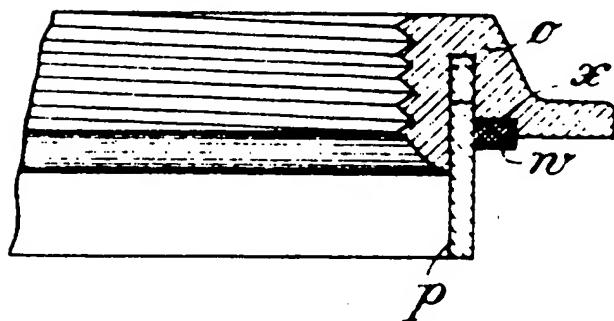


Fig. 11

